

What is claimed is:

1. A disc presentation apparatus comprising:
a feed-in conveyor which advances a disc cassette comprising a caddy
portion confining a disc and a lid portion;
5 a delidder assembly communicating with the feed-in conveyor which
removes the lid portion;
a caddy elevator with an attached grip and rotate assembly which rotates
and indexes the delidded caddy portion for presentation of the disc;
and
10 a re-lid assembly adjacent the caddy elevator which confines the caddy
portion while the delidder assembly rejoins the lid portion to the
caddy portion at a time.
2. The apparatus of claim 1, further comprises a sliding conveyor
15 assembly communicating with the feed-in conveyor, the sliding conveyor assembly
shuttles the disc cassette between the feed-in conveyor and the delidder assembly.
3. The apparatus of claim 1, further comprises an out-feed conveyor
with a proximal end communicating with the re-lid assembly, the out-feed
20 conveyor transferring the caddy portion rejoined with the lid portion from the re-
lid assembly to a distal end of the out-feed conveyor.
4. The apparatus of claim 2, in which the feed-in conveyor comprises
a first gating device working in tandem with an electronic sensor to facilitate
25 advancement of not more than one disc cassette onto the sliding conveyor
assembly.
5. The apparatus of claim 2, further comprises a staging conveyor
section communicating with the sliding conveyor assembly, the staging conveyor
30 section supporting the disc cassette prior to engagement of the disc cassette by grip
and rotate assembly, and in which the caddy elevator selectively positions the grip
and rotate assembly from a caddy clearance position above the staging conveyor

section to a caddy release position adjacent the re-lid assembly, and wherein the re-lid assembly is supported by an out-feed conveyor.

5 6. The apparatus of claim 5, in which the sliding conveyor assembly comprises:

 a first extensible slide assembly secured to the feed-in conveyor for extending a sliding conveyor section of the sliding conveyor assembly;

 a support plate attached to the first extensible slide plate providing structural support for the sliding conveyor section; and

 a retention device working in conjunction with an electronic sensor to facilitate controlled advancement of the disc cassette from the sliding conveyor assembly to the staging conveyor section.

15 7. The apparatus of claim 4, in which the first gating device comprises a pneumatically controlled disc cassette gating device responsive to a pneumatic cylinder.

20 8. The apparatus of claim 6, in which the retention device comprises a pneumatically controlled retention device responsive to a pneumatic cylinder.

 9. The apparatus of claim 5, in which the re-lid assembly comprises:
 a second extensible slide assembly secured to a proximal end of the out-feed conveyor for transporting the caddy portion from the caddy release position to a re-lid position of the out-feed conveyor;
25 a support plate attached to the extensible slide assembly, the support plate providing structural support for transporting the caddy portion from the caddy release position to the re-lid position;
 a pneumatic gripper securing the caddy portion relative to the support plate
30 during transport of the caddy portion between the caddy release position and the re-lid position; and

a second gating device working in conjunction with an electronic sensor to confine the caddy portion while the lid portion is rejoined to the caddy portion.

5 10. The apparatus of claim 1, in which the delidder assembly comprises:

 a lid elevator secured to the frame, the lid elevator transports the lid portion from a lid clearance position above the feed-in conveyor to a re-lid position above an out-feed conveyor;

10 a grip slide support plate secured to the lid elevator and sized to support the lid portion during transport of the lid portion;

 a lid present electronic sensor which detects presence of the lid portion; and

 a linear actuating gripper slide with an attached grip finger secured to the grip slide support plate and responsive to the lid present electronic

15 sensor, wherein the grip finger grips the lid portion during removal of the lid portion from the disc cassette, and wherein the grip finger further holds the lid portion following the removal of the lid portion from the disc cassette.

20 11. The apparatus of claim 1, in which the grip and rotate assembly comprises:

 an actuator support plate secured to the caddy elevator and sized to support the caddy portion during rotation and indexing of the caddy portion;

25 a caddy positioned electronic sensor which detects presence of the caddy portion;

 a linear over-travel slide secured to the actuator support plate precluding damage to the disc during indexing of the caddy portion; and

 a rotary actuator supporting a grip assembly, the grip assembly providing a

30 holding device constraining the caddy portion relative to the rotary actuator in response to the caddy positioned electronic sensor sensing presence of the caddy portion, the rotary actuator rotating the caddy portion from a substantially horizontal orientation to a

substantially vertical orientation, wherein access for removal of the disc is provided.

12. The apparatus of claim 10, in which the linear actuating gripper is
5 pneumatically operated.

13. The apparatus of claim 11, in which the rotary actuator and the holding device are each pneumatically operated.

14. A method of presenting a disc from a disc cassette comprising caddy portion and a lid portion by steps comprising:

locating a disc cassette relative to a delidder assembly for removal of the lid portion; and

5 rotating the caddy portion with a grip and rotate assembly from a substantially horizontal orientation to a substantially vertical orientation, wherein the grip and rotate assembly is supported by a caddy elevator, the caddy elevator indexing the caddy portion to present the disc in a final position.

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15. The method of claim 14, by steps further comprising:
transferring the caddy portion to a staging conveyor section to await pick-up by the grip and rotate assembly;

securing the caddy portion with the grip and rotate assembly; and
15 elevating the caddy portion above the staging conveyor section with the grip and rotate assembly to assure noninterference between the caddy portion and the staging conveyor section during indexing of the caddy portion between opposing rails of the staging conveyor section.

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16. The method of claim 14, by steps further comprising:
removing the disc from the caddy portion;
rotating the caddy portion from the substantially vertical orientation to the substantially horizontal orientation with the grip and rotate
25 assembly;

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depositing the caddy portion on a re-lid assembly;
releasing the caddy portion from the grip and rotate assembly;
positioning the caddy portion to a re-lid portion of an out-feed conveyor with the re-lid assembly;

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rejoining the lid portion with the caddy portion, thereby reforming the disc cassette;

advancing the reformed disc cassette along the out-feed conveyor; and
aligning the grip and rotate assembly with the staging conveyor section.

17. The method of claim 15, by steps further comprising:
positioning a disc cassette on a feed-in conveyor;
metering the disc cassette onto a sliding conveyor assembly from the feed-
5 in conveyor; and
shuttling the disc cassette between the feed-in conveyor and the delidder
assembly with the sliding conveyor.

18. A data storage device combination comprising a motor assembly rotating a disc into a data exchange relationship with a read/write head, the disc presented for attachment to the motor assembly by steps for presenting the disc executed by means for presenting the disc.

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19. The data storage device of claim 18, in which the means for presenting the disc comprise:

a frame supporting a feed-in conveyor that advances a disc cassette with a caddy portion confining a disc;

10 a delidder assembly communicating with the feed-in conveyor removes a lid portion of the disc cassette from the caddy portion of the disc cassette;

a caddy elevator with an attached grip and rotate assembly supported by the frame rotates and indexes the caddy portion for presentation of the disc; and

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a re-lid assembly adjacent the caddy elevator confining the caddy portion while the delidder assembly rejoins the lid portion to the caddy portion.

20 20. The data storage device of claim 18, in which the steps for presenting the disc comprise:

positioning a disc cassette comprising caddy portion and a lid portion on a feed-in conveyor, wherein the caddy portion cradles the disc;

metering the disc cassette onto a sliding conveyor assembly one at a time;

25 shuttling the disc cassette between the feed-in conveyor and the delidder assembly with the sliding conveyor;

locating the disc cassette relative to the delidder assembly for removal of the lid portion;

gripping the lid portion with a grip finger attached to a linear actuating gripper slide of the delidder assembly;

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activating the linear actuating gripper slide to detach the lid portion from the caddy portion;

separating the lid portion from the caddy portion by displacing the lid
portion from the caddy portion with a lid elevator;
transferring the caddy portion to a staging conveyor section to await pick-
up by the grip and rotate assembly;
5 securing the caddy portion with the grip and rotate assembly;
elevating the caddy portion above the staging conveyor section with the
grip and rotate assembly to assure noninterference between the
caddy portion and the staging conveyor section during indexing of
the caddy portion between opposing rails of the staging conveyor
10 section;
rotating the caddy portion with a grip and rotate assembly from a
substantially horizontal orientation to a substantially vertical
orientation, wherein the grip and rotate assembly is supported by a
caddy elevator, the caddy elevator indexing the caddy portion to
15 present the disc in a final position;
removing the disc from the caddy portion;
rotating the caddy portion from the substantially vertical orientation to the
substantially horizontal orientation with the grip and rotate
assembly;
20 depositing the caddy portion on a re-lid assembly;
releasing the caddy portion from the grip and rotate assembly;
positioning the caddy portion to a re-lid portion of an out-feed conveyor
with the re-lid assembly;
rejoining the lid portion with the caddy portion using the delidder
25 assembly, thereby reforming the disc cassette;
advancing the reformed disc cassette along the out-feed conveyor; and
aligning the grip and rotate assembly with the staging conveyor section.